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(54) Tamper Sealed Bag with Reusable Closure

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TAMPER SEALED BAG WITH REUSABLE CLOSURE

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ABSTRACT OF THE DISCLOSURE

A method of handling a pre-formed, open-mouthed bag having a filled and an unfilled bag portion, comprises continuously conveying the bag through a plurality of automatic bag handling stations where the unfilled bag portion is gripped to produce a flattening of the unfilled bag portion with the bag mouth in an essentially unstressed condition. The bag mouth is then sealed and a reusable bag closure is applied to the unfilled portion of the bag.

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FIELD OF THE INVENTION

The present invention relates to a method of handling a pre-formed filled bag where the mouth of the bag is sealed and a separate closure is applied to the bag.

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BACKGROUND OF THE INVENTION

Product tampering in retail outlets at the point of sale has become a very big problem. Tamper-proof caps are provided on pill bottles and the like. There is, however, nothing in the way of tamper-prevention seals provided on currently available pre-formed open-mouthed bags, such as bakery products, produce, ice, citrus, fruit and milk bags. In contrast, these particular types of bags are simply secured by a reusable closure which can easily be removed from the bag, allowing tampering and replacement of the closures. Accordingly, a person buying bagged milk and/or a bag of bread would not have any means of determining whether or not there had been any tampering to the product in the bag.

Certain types of bags are sealed. These are referred to as form-filled bags such as those used for packaging of candies. A form-filled bag is one in which an elongated tube of bag material is cut at specific locations to make smaller bags which are filled with material and sealed. The sealing is achieved while the bag is in a relatively stationary position.

Form-filled bags are to be distinguished from pre-formed bags. A pre-formed bag is one which is made with a closed bottom and an open mouth for receiving product to be later deposited into the bag. Pre-formed bags such as the milk and bread bags noted above, are fed along a moving conveyor for closure of the bag. These types of bags have not been successfully sealed because any consideration with respect to sealing has been dismissed in view of the fact that these bags are continuously moving along a bag handling system. Therefore, it has been considered in the past that the seal would not have time to set and therefore the stress caused by the product in the bag would cause the seal to separate. Furthermore the seal cannot be applied sufficiently close to the product to prevent its shifting in the bag.

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SUMMARY OF THE PRESENT INVENTION

The present invention provides a method of handling a pre-formed open-mouth bag having a filled and an unfilled bag portion. The method is carried out while continuously conveying the bag through a plurality of bag handling stations and comprises gripping the unfilled bag portion which produces a flattening of the unfilled bag portion with the mouth of the bag in an essentially unstressed condition, sealing the mouth of the bag and applying a reusable bag closure to the unfilled portion of the bag.

The key to the present invention is the gripping of the unfilled bag portion away from the bag mouth in a manner such that there is no stress on the seal as it is applied to the bag mouth. This particular feature allows the sealing process to be carried out while the bag is in continuous movement through the bag handling system because the seal does not have to set against pressure created by product within the bag. It is the bag grippers rather than the seal that absorbs the pressure of the product in the bag.

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BRIEF DESCRIPTION OF THE DRAWINGS

The above as well as other advantages and features of the present invention will be described in greater detail according to the preferred embodiments of the present invention in which Figure 1 is a perspective view of a bag handling system according to a preferred embodiment of the present invention. Figure 2 is an end view of the bag sealing station from the system of Figure 1. Figure 2A is a perspective view of the belts used in the bag handling station of Figure 2. Figure 2B is an enlarged perspective view of the heat sealer of Figure 2. Figure 2C is a side view of the upper end of the bag after having gone through the heat sealing station of Figure 2. Figure 3 is a perspective view of an alternate bag handling system according to a further preferred embodiment of the present invention.

DETAILED DESCRIPTION ACCORDING TO THE PREFERRED EMBODIMENTS
OF THE PRESENT INVENTION

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Figure 1 shows an overall bag handling system generally indicated at 1. This bag handling system is used to handle a pre-formed open-mouth bag generally indicated at 3. Bag 3 as best seen to the left hand side of the drawing has an open mouth 5 and a sealed bottom 6. This bag is previously filled with product P. In this particular case the product is three sealed milk pouches.

As best indicated in Step 2 of Figure 1, the bag where loaded comprises a filled bag portion 7 and above that there is an unfilled bag portion 9. The unfilled bag portion terminates in the mouth 5, which is initially open and then sealed by the end of the bag handling line.

The bag is placed as shown in the left hand side of Figure 1 with its sealed bottom on a conveyor 11. The open mouth is located at the top of the bag. The bag is carried by the conveyor to a pair of rotating brushes 13, where the unfilled bag portion is fed between the brushes, which rotate to expel air from the upper part of the bag and which push up the unfilled bag portion. This provides in effect a preshaping of the bag at the juncture between the unfilled bag portion and the filled bag portion, as indicated at 10 in Figure 2. There is stress on the bag at this preshaped region but the unfilled bag portion, specifically the mouth of the bag, is slack or unstressed above the preshaped region.

The bag passes immediately from the brushes to a further bag handling station including a pair of rotating belts 15 which grip the unfilled bag portion beneath the open mouth after it has been preshaped by the brushes. Both the brushing and the gripping of the bag by belts 15 causes the unfilled bag portion to flatten, with the bag mouth 5 in an essentially unstressed condition. The belts hold the unfilled bag portion so that it stands upright where the

bag mouth 5 is fed through a pair of heat sealers 17, producing a seal 19 along the mouth of the bag. This seal is applied as the bag continuously moves through the gripping and sealing station without slowing the bag handling operation whatsoever. As earlier stated, the reason that the bag is able to continuously move and at the same time be effectively sealed is that the bag mouth is not under any pressure to separate while the seal is applied so that the seal does not have to be held while it sets.

In the particular arrangement shown the Figures 2 and 2B the heat sealers comprise rotating heat seal wheels, one of which is provided with unheated serrating teeth 18. These teeth prescore the bag as indicated at 20 immediately beneath the heat seal 19.

In addition, heat seal wheels 17 are divided into an upper heated wheel portion 17c and a lower unheated wheel portion 17d. The upper heat wheel portion performs the heat sealing operation. The lower unheated wheel portion includes an embossed bag coder which applies a bag code 22 beneath the serration as also seen in Figure 2C.

The preweakening of the bag by the serrations allows easy removal of the seal by the consumer. However any tampering at the bag top prior to purchases is still evident.

The bag code, which is pressed into the bag rather than including anything in the way of printing inks etc, indicates things such as where the product originated, date of the product etc. The code stays with the bag even after the seal has been removed. In the case of products such as bagged milk this is important because the manufacturer can easily determine whether product returns are justified. If the retailer attempts to switch the product from one bag to another the seal again indicates "retailer tampering."

() After the bag mouth is sealed it is then passed onto a reusable closure applying station 21. This station presents a closure member 25, which could be wire, tape, etc. or as shown a KWIK LOK™, which is a small plastic, clip into which the bag is fed by a pair of rollers 23, which are part of the closure application station. After the closure has been applied, the bag includes both a sealed mouth and a reusable bag closure as shown to the far right hand side of Figure 1. This is the way the bag appears in the retail outlet. Note that the KWIK LOK and not the seal is tightly against the product prevents its shifting in the bag.

Figure 3 shows a slightly different bag handling system from that shown in Figure 1. In this particular setup the product P1, loaded into bag 3A, is bread. In this case the bag is shown as being handled in a horizontal as opposed to a vertical position. Furthermore, Figure 3 shows the additional step of loading the bread into the bag.

Pre-formed bag 3A includes a previously sealed end 6A and an open mouth 5A, through which the bread is loaded into the bag. This produces a filled bag portion 7A and an unfilled bag portion 9A. The bag is moved along a continuous conveying system to a pair of brushes 13A which expel air from the bag and preshape the unfilled bag to collapse inwardly around the product in the filled bag portion while flattening the unfilled bag portion outwardly away from the product in the bag.

After leaving brushes 13A, the bag is passed to a bag gripping and sealing station including gripping belts 15A and heat sealers 17A provided with attached unheated serrating teeth 19A. These heat sealers provide a seal 19A along the mouth of the bag and also serrate or prescore the bag immediately beneath seal 19A.

After the bag mouth is sealed, it is passed to a closure applying station substantially the same as that shown in Figure 1, resulting in a bag that includes a sealed mouth as well as a reusable closure applied to the unfilled bag portion between the product and the mouth of the bag.

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In both of the examples shown in Figures 1 and 3, the pre-formed bag is only filled to a depth such that it leaves a workable unfilled bag portion referred to as a bag tail. This bag tail must be sufficiently long to allow preshaping of the unfilled bag portion around the product in a manner which still leaves the bag mouth slack or unstressed for sealing while the bag continuously moves along the bag handling system.

At the point of sale and in contrast to presently existing bread and milk bags, the bag cannot be tampered with by simply removing the closure, opening the bag, inserting a foreign substance into the bag, and then reclosing the bag. With bags manufactured according to the present invention the seal would first have to be opened, which would immediately indicate the possibility of some tampering having been done to the bag contents.

After purchasing the bag and when the consumer takes the bag home, the seal can quickly and easily be removed, either by cutting it from the bag or, in the case of a preweakened bag, by ripping it from the top of the bag. However, even after the seal has been removed there is more than enough of a bag tail to reuse the closure applied to the bag.

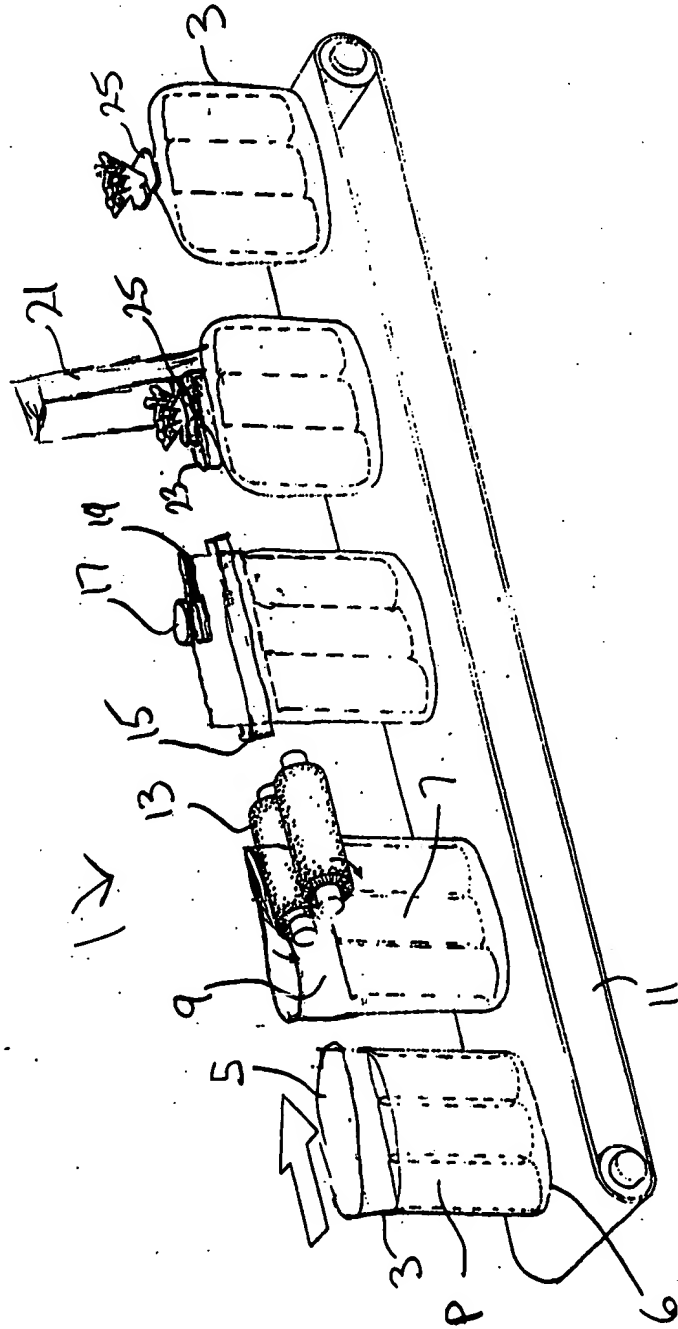
Although various preferred embodiments of the invention have been described in detail, it will be appreciated by those skilled in the arts that variations may be made without departing from the spirit of the invention or scope of the appended claims.

CLAIMS

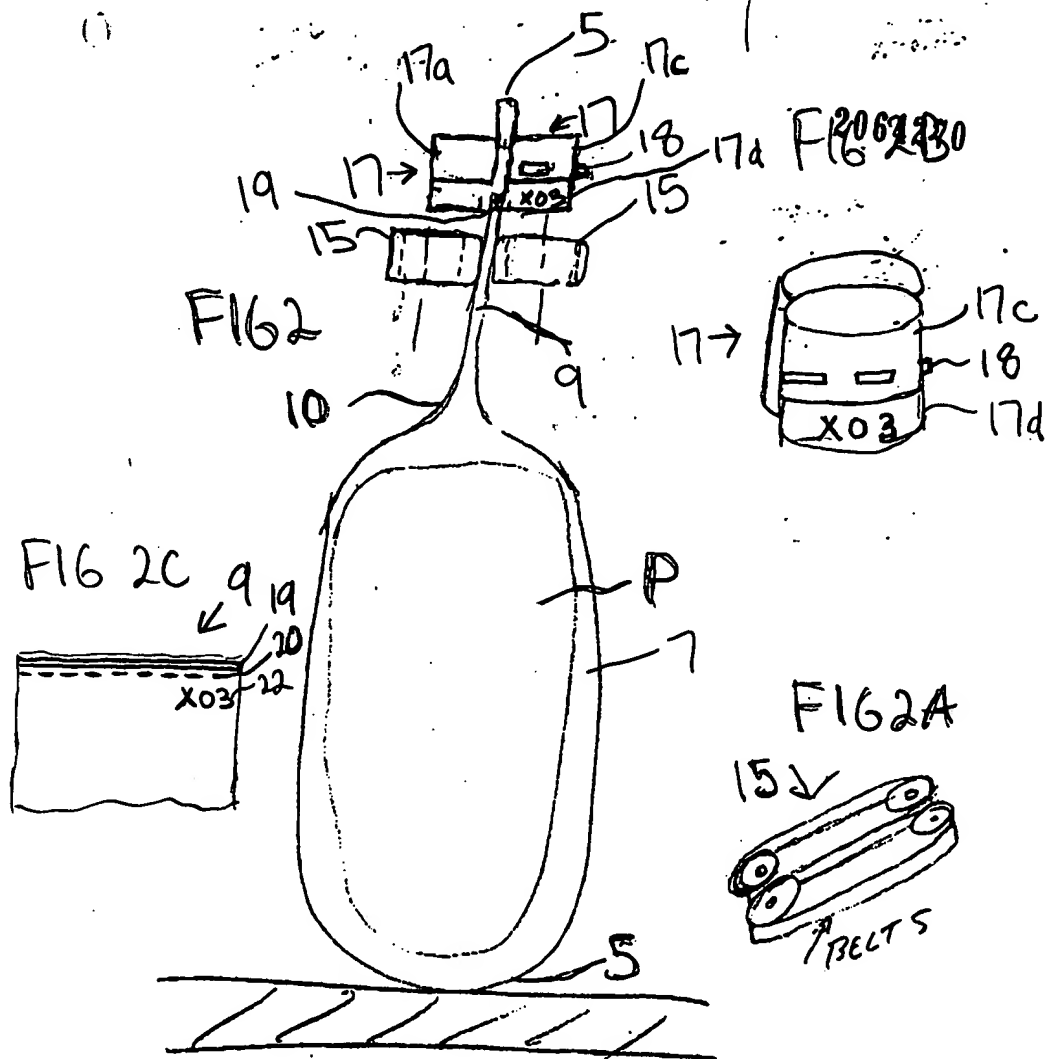
1. A method of handling a pre-formed open-mouth bag having a filled and an unfilled bag portion, said method being carried out while continuously conveying the bag through a plurality of automatic by handling stations and comprising gripping the unfilled bag portion away from the bag mouth to produce a flattening of the unfilled bag portion with the bag mouth in an essentially unstressed condition, sealing the bag mouth and applying a reusable bag closure to the unfilled portion of the bag.
2. A method as claimed in Claim 1 including applying pressure across the unfilled bag portion where it meets with the filled bag portion to exhaust air from the unfilled bag portion and to preflatten the unfilled bag portion immediately adjacent the filled portion prior to gripping the unfilled bag portion.
3. A method as claimed in Claim 1 including preweakening the unfilled bag portion adjacent the bag-mouth.
4. A method as claimed in Claim 3 including preweakening the unfilled bag portion while sealing the bag mouth.
5. A method as claimed in Claim 1 including coding the bag.
6. A method as claimed in Claim 5 including pressing a code into the bag without printing media.
7. A method as claimed in Claim 1 including applying a seal at, providing a providing a preweakened region inwardly of the seal, and pressing a code into the bag inwardly of the preweakened region on the unfilled bag portion.
8. A method as claimed in Claim 1 including automatically loading product into the bag to a depth less than the length of the bag producing the filled bag portion and the unfilled bag portion.

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FIG 1

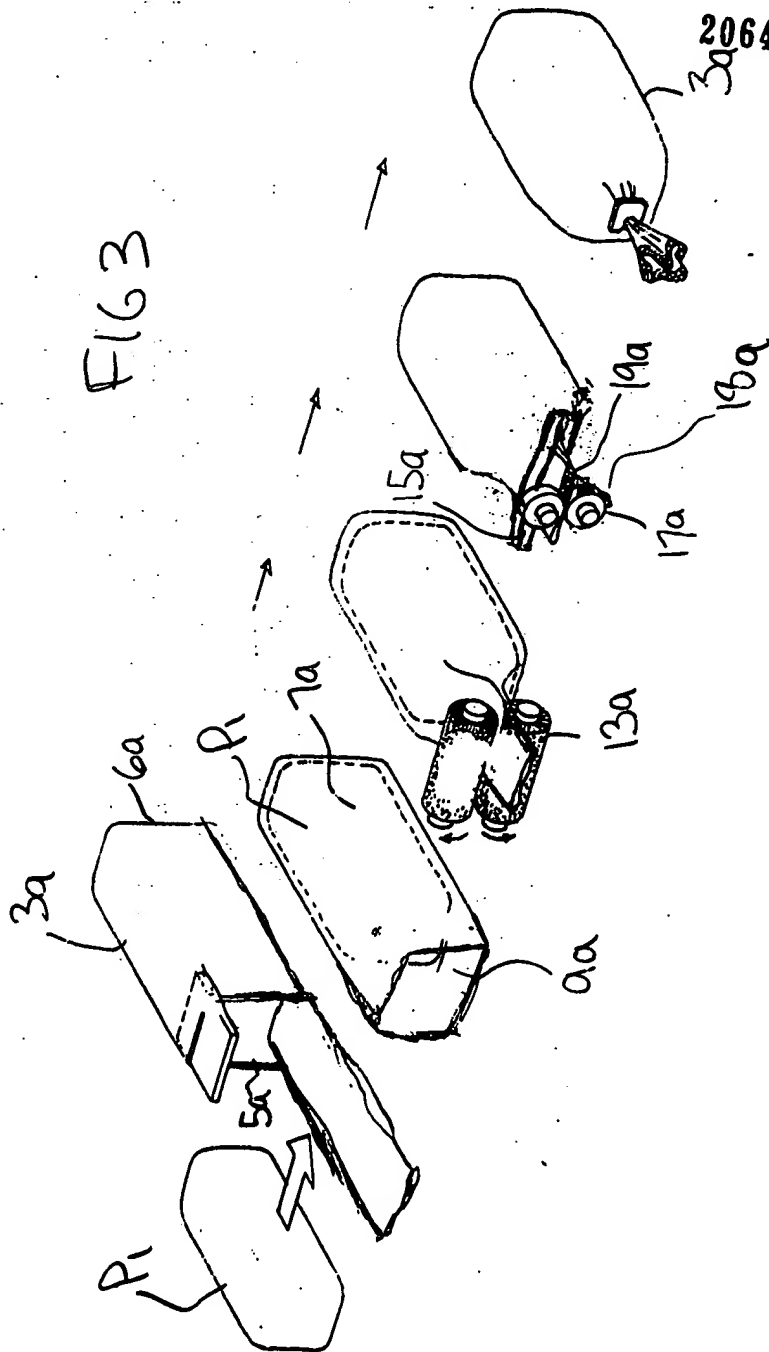


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